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The Use of Bankhead-Jones Funds to Promote a Coordinated Program
of Research between the States in Cooperation with the
United States Department of Agriculture 1/

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In considering this subject let us think not merely of research projects or groups of research projects. Rather let us view the subject from its broader aspects, involving a number of principles of importance in promoting an effective coordinated program. The following points especially should be kept in mind:

(1) The importance of developing the findings of our research to the point that they can be applied by other agencies, locally, as well as by larger areas, and for the Nation as a whole. Failure on the part of many people to recognize this responsibility of the stations and the Department leads to the conclusion, unwarranted in many cases, that there is duplication, and that coordination and cooperation are woefully lacking. Unless we, as research workers and administrators, understand and recognize this responsibility, we will have difficulty in promoting a most effective program between States in cooperation with the Department. Understanding of this responsibility is basic to understanding each other's point of view and the part in a coordinated program that each State and the Federal Government should undertake and how the work of all can best be integrated into a program for the common good.

(2) The selection of problems which are really suited to a coordinated program of research. Coordination is not an end in itself. It is quite as important not to attempt cooperation beyond understanding of

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each other's work in cases where there is little or nothing to be gained as it is to arrange cooperation on problems needing joint attack for most effective and timely solution. If we concentrate our efforts for coordination, first, on problems recognized as of major concern to more than one State, and a responsibility also of the Federal Government, our task is much simplified. In other words, in effective coordination we should think on the basis of joint problems and not waste too much effort in thinking of the research organizations as a whole.

(3) The development, maintenance, and use of physical plant and equipment. A considerable part of each dollar available for research necessarily goes into physical plant and equipment. At best, it is a problem to keep abreast of needs in this respect. Careful joint thought on this point in the use of Bankhead-Jones funds to promote coordination can be productive for research.

(4) The full use of existing facts already accumulated by the State stations and the Department. There has been exchange of ideas as to whether surveys in themselves constitute research. Ordinarily surveys are a part of research in that they are necessary to secure facts for analysis, interpretation, and development of correlations and principles for application. Many of the newer problems confronting the research organization afford opportunity for coordination and cooperation in making available facts which could not be duplicated without waiting for the results of new trials.

(5) The most effective use of trained, experienced research personnel. I have in mind especially the personnel trained and capable of leadership. This point is important in two respects. Cooperation in this regard makes

possible more prompt attack on problems common to a considerable area and yet needing local attention. Of equal importance, cooperation in this respect will aid in maintaining some flexibility in funds and organization. It is difficult to transfer highly trained specialists from research in their respective fields to research in other fields. If funds are largely tied up in staff, flexibility is lacking and there is difficulty in meeting new problems without additional funds, which may not be made available.

(6) For the purpose of this discussion we are considering primarily the Bankhead-Jones fund. By itself this fund would not, perhaps, be especially effective in promoting a coordinated program. In 1937 it will amount to only approximately 6 percent of the total funds available to the State stations and the Department; only approximately 12 percent of the total funds available to the States; and only approximately 30 percent of the total Federal-grant funds to the States. The Bankhead-Jones Act provides that research, especially the research of the Department under this fund, shall be in addition to, but coordinated with, research on other funds. Most effective use of this fund, therefore, will be in conjunction with other funds, including physical plant facilities, personnel, and available facts from other funds.

Other points might be considered. These six are selected in the hope that having them in mind, the use of the Bankhead-Jones fund in promoting coordination will be clarified and, perhaps, may take on some new elements of significance.

Now let us examine the record. Some 360 odd projects have been formulated and approved for support under the Bankhead-Jones allotments to the States. Three regional laboratory projects have been approved and established

under the regional laboratory provision of the Act. Thirty-six special research projects have been approved by the Secretary under the special fund available to the Department. In adjusting and strengthening State station programs with the Bankhead-Jones fund available, 251 new and revised Purnell projects were formulated and approved, and 63 new and revised Adams projects were formulated and approved. These numbers in themselves mean little. For the purpose of this discussion they indicate, in a way, the number of new projects available largely at our discretion as to use in promoting a coordinated program of research between the States in cooperation with the Department.

The regional laboratory provision of the Bankhead-Jones Act is a major factor in the use of Bankhead-Jones funds for promotion of a coordinated program. The Act requires that these laboratories be established in major agricultural regions. The Act provides further that the research of these laboratories and other research under the Act, especially research of the Department, shall be in addition to, but coordinated, so far as practicable, with research under other funds. As you know, before any laboratories were established, a policy was adopted based upon joint consideration and suggestions of the State station directors and the bureaus of the Department. This policy contemplates, among other things, that regional laboratory projects will be selected on the basis of joint suggestions from the directors in each major agricultural region and suggestions from the bureau chiefs of the Department; the location of such a laboratory will be determined on the basis of technical needs of the proposed research and the facilities available, and whenever feasible will be located at an existing Federal or State

experiment station or branch thereof; the nature of the research to be undertaken; the relationships of the laboratory and the laboratory program to the State stations, and their respective programs and the part that each agency will take in the laboratory program will be worked out through joint conference of directors and their staffs and the representatives of the Federal bureaus concerned.

The three laboratories already established have been initiated according to these principles. As an example, the Laboratory for Research into Laws and Principles Underlying Pasture Improvement in the Northeastern Region, located at State College, Pa., was approved after most careful joint consideration in the selection of a project of first concern to the agriculture and to the State stations in this region and to the Department. Likewise, the scope of the project and relationships between the Department and the State stations were most carefully considered by the Federal and State representatives through friendly, but critical, analysis of all factors so far as they could be anticipated. Also, the location was selected most carefully with the full cooperation and advice of all agencies, being at a land-grant institution.

There has been similar care in the selection of leadership for the laboratory and in the coordination of all pasture work, including the proposed laboratory program in the region. The laboratory will serve primarily as a focal center for research applicable in large degree throughout the region. The State stations will integrate their research with the laboratory program so as to develop findings to the point that they will be applicable to local and regional conditions. There will no doubt be results from the combined program which will be of value to other regions.

While the use of the Bankhead-Jones laboratory fund has been perhaps the key factor in furthering this coordinated program, the Bankhead-Jones fund allotments to the States and the other Federal funds to the Department have been of significance. The 12 State stations of the region have adjusted their pasture research programs to include a total of 25 projects directly related to the coordinated pasture program. Of these, 10 projects are on Bankhead-Jones funds. Most of these States receive only a small amount of Bankhead-Jones funds and other Federal-grant funds and State funds are being used. On the other hand, the experienced personnel and all existing facts of the Department are made available.

If we examine this brief statement relative to the laboratory projects we find that the six principles or points which I outlined have been considered, and, as a matter of fact, have been of significance in formulating this coordinated program. The program provides for development of findings to the point of application. The laboratory selected is one of such interest to all States that each can properly concentrate some effort and funds in the promotion of a program. The plan contemplates the use of existing physical plant and equipment, as far as practicable, so as to minimize expenditure of research funds for these purposes. The existing facts, research, experience of the Department and the State stations have been considered in deciding upon character and scope of work to be undertaken. As the program develops, it is planned, through joint consideration, to make the best use of trained, experienced research personnel, both in an advisory way and through participation in the program of research. Should the work develop to warrant cooperation with agencies responsible and experienced in related

phases, such as animal nutrition, for example, cooperation with such agencies is contemplated. The idea is the development of coordinated, cooperative action around the problem. Further cooperation may be arranged at such times as it will result in most effective research attack.

The same procedure and principles have been followed in establishing the soybean research laboratory in the Corn Belt region at the University of Illinois. One phase of this laboratory is somewhat different and deserves mention. The primary purpose of the laboratory is research into the industrial utilization of the soybean and soybean products. This means that perhaps most emphasis will necessarily be in chemical research. However, the ultimate development of a new use may be dependent upon plant breeding or selection or upon production methods to make available soybeans of a quality and at a cost consistent with the needs and economy of the new use in question. Therefore, the Federal-State program for this laboratory includes definite planned coordination of the industrial research phases with the production phases of research.

The regional laboratory of the southeastern region, near Charleston, S. C., provides for research for the development of improved varieties of vegetable crop plants having superior adaptation to the southeastern region of the United States. This was the first laboratory established. While the procedure in initiating such laboratories is developing with each new laboratory, the major principles are the same. The plan is for the laboratory to concentrate upon the creation of new, improved germ plasm so to speak. The respective States will assume primary responsibility for the further development, by selection, testing, cultural practices, seasons of

planting, and other phases to develop a program to the point of application, locally and for the region.

Let us consider further the use of the Bankhead-Jones allotments to the States in promoting coordination and cooperation. For example, the regional laboratory for pasture investigations in the Northeast is assigned for leadership in the Department to the division of the Bureau of Plant Industry which is responsible for pasture investigations throughout the country, thus assuring the closest practicable coordination of the regional pasture laboratory program with other pasture investigations, so far as the Department is concerned. Examination of the Bankhead-Jones projects shows that aside from the laboratory program, 31 pasture and range projects were undertaken by States in other regions. For the most part they are definitely cooperative with the investigations of the Department along the same lines and serve to a considerable degree in strengthening the program of investigations in this field. A total of about \$68,000 of the Bankhead-Jones allotments to States has been assigned directly to this line of work. In Florida, the Bankhead-Jones fund has been used to provide much needed land and physical plant facilities and to strengthen the research. In Utah, the Bankhead-Jones fund was of help in enabling the State station to release other funds for purchase of suitable land which was absolutely needed to make possible cooperation of the State station, the Bureau of Plant Industry, and the Forest Service on a coordinated attack involving problems on public ranges, on pastures, and on farms. In Nebraska, this fund helped the station to provide greenhouse facilities for cooperation involving the station, the Bureau of Plant Industry, and the Soil Conservation Service. In Colorado, this fund helped to make possible the employment of trained personnel to

represent the State in cooperative investigations in the field of pastures and ranges. There is indication that this development and strengthening of a coordinated pasture program is being given still further support from the 1937 increase in the State portion of the Bankhead-Jones fund.

The Bankhead-Jones Act authorized the use of the funds for research related to the conservation, development, and use of land for agricultural purposes. In accordance with this authority, a considerable amount of Bankhead-Jones funds has been used in the coordinated study of land use and adjustment in which the 48 States and several bureaus of the Department are cooperating. As an aid to coordination on the part of the Department, the other bureaus cooperate with the States through the Bureau of Agricultural Economics, which has existing working relationships with the State stations.

As examples of a somewhat different type, cotton and tobacco might be cited. Before the Bankhead-Jones funds were available, efforts were already under way for coordination and strengthening of the cotton research program. Of the Bankhead-Jones allotments to States, over 40 percent goes to the States of the Cotton Belt. This increase in funds has enabled the States, in cooperation with the Department, and individually, to strengthen the cotton research. In 1936 the support of State projects was increased by about \$20,000. Nearly double this amount of Bankhead-Jones funds is assigned to cotton research for 1937. In a field of research as large and as complex as cotton, the development and strengthening of a coordinated program is not a week end job. It is significant that in strengthening the work with additional funds from Bankhead-Jones, for example, that genetics, cytology, and metabolism of cotton are being strengthened in one State in cooperation with the Department. Research on cotton fiber in relation to physical prop-

erties and spinning value is being strengthened by cooperative effort at another station where facilities and manpower are available. Genetic inheritance of cotton characters is being strengthened at another station. At still another, research on cotton seedling diseases is being strengthened in cooperation with the Department. I mention these items since they represent a joint effort to strengthen important research through concentrating effort in a way to avoid duplication and make good use of physical plant and experienced personnel. The use of the Bankhead-Jones fund in this regard has been limited to two years' allotment. The authorization of the Act provides for an increase in funds for the first five years. During 1935 the State and Federal research workers organized a Cotton Disease Council for the primary purpose of coordinating the entire cotton disease research program. This activity is moving forward satisfactorily. The importance of cotton, the number and complexity of problems needing research, and the fact that a large part of the Bankhead-Jones fund goes to the Cotton Belt would seem to justify continuous attention to promoting and strengthening a coordinated program of research between the States in cooperation with the Department.

In the case of tobacco, about \$25,000 of Bankhead-Jones funds was assigned by the States to strengthen the program, in cooperation with the Department, during 1936. The information to date indicates that nearly double this amount, or \$50,000, will be assigned to this program in 1937. A coordinated breeding program is well under way. A comprehensive program of tobacco nutrition studies with emphasis on mineral deficiencies is being carried on by the Department in cooperation with eight States. In 1935 a Tobacco Disease Council to assist in planning a coordinated attack on to-

bacco disease problems was organized by the Federal and State workers in this particular field. The use of Bankhead-Jones funds has assisted in the development of this program in some of the States.

To illustrate what might be considered as another beginning, or peg, in the use of Bankhead-Jones funds to promote a coordinated program, I might cite joint consideration on the part of three States and the Department of research for production and improvement of mules. The three States concerned each considered as important the undertaking or strengthening of their research on this subject. The Department had received a slight increase in funds for such work. Representatives of the three States and of the Department met in conference, agreed upon plans and relationships for cooperation, and agreed upon the phases of research to be undertaken as a primary responsibility at each of the stations and by the Department. If this joint undertaking proves effective, as we hope that it will, it would seem that additional projects, especially those financed from Bankhead-Jones or other Federal-grant funds, should be coordinated with the work now being formulated so as to develop, either formally or informally, a program with an objective similar to that described for a regional laboratory. In this way physical plant facilities, manpower, funds, and local aspects of the general problem can be all taken into account.

Through initiative of the State stations or their staff members, progress has been made in developing coordinated programs among the States having common problems. The tobacco States were active in developing their tobacco program; the New England States have been active in developing a cooperative program for study of milk marketing in New England; the Middle West States have made progress in organizing cooperative investigations on

certain human nutrition problems in the field of home economics. These home economics projects are on Purnell and State funds but the principle is the same. There are many instances of informal cooperation through understanding and integration of researches. Director Fletcher perhaps will have suggestions for further development in this regard. As a director, his judgment as to possibilities and procedure should be better than mine. I merely direct attention to this field as deserving of consideration.

It would seem to me that without formal cooperation a coordinated program can gradually be developed, to a considerable extent at least, in such fields as animal nutrition. Approximately one-sixth of the State allotments of Bankhead-Jones funds for 1936 was assigned to some 60 projects in connection with animal production, mainly in the fields of nutrition of the larger animals and poultry. These are concerned largely with the principles and needs as to utilization of vitamins and minerals by animals. The researches are fundamental in character and the results should be of broad application. The local phases of problems involved vary a good deal. The research necessarily is broken down into attack by small units of work. In some respects parallel investigations by two or more investigators may be desirable, if not essential. The development of a coordinated program in this field is wise only after most careful consideration. However, the economic importance of the problems involved, the type and cost of the research needed, and the possible advantages of checking results may merit thought with a view to strengthening the research program in this field through coordinated effort during this period when increases in funds may become available.

Animal breeding is another field in which there may be opportunity for a coordinated program, with or without formal cooperation. Approximately

\$40,000 of Bankhead-Jones funds was assigned to projects in this field during 1936. The projects have been planned in a way that they may well serve as a nucleus for expansion, and, at the same time, they fill gaps in the program as under way at present.

A discussion of this subject would not be complete without a brief statement as to the use of Bankhead-Jones funds by the Department in developing its program of special projects, aside from laboratories, under the departmental part of the fund. To date, 36 projects have been approved and initiated with the Secretary's approval. Of these, 9 of the larger undertakings, involving approximately one-half the funds available in 1936 and in 1937, are being undertaken with State cooperation. As examples, a project for investigation of grain storage on the farm is being undertaken cooperatively by 3 bureaus of the Department and 6 State stations. Attempt has been made to plan and organize the project so as to make best use of experienced leadership and local knowledge, physical plant facilities, and bring into the investigation the various technical groups which can and should contribute. A fundamental study involving genetics and cytology is cooperative between a bureau and a State station and the research is being done primarily at the State station.

Twenty-seven of the projects, involving about half of the fund, are of such character and so limited in scope that cooperation could not be productive as far as the work is planned and approved at present. Time will not permit a discussion of the projects, but I shall be glad to answer questions or furnish information later, if desired.

In our discussion of a research program under the Bankhead-Jones Act a year ago, I stated that "rather than attempt to formulate a definite pro-

gram, the task before us, in my judgment, is to chart a course, consistent with the provisions of the Act, which may be agreed upon as desirable and yet not so lacking in expediency that it cannot be adhered to." In my judgment, this statement holds good today. I have, therefore, attempted not a complete report or catalog of projects, but a statement of principles and ways of promoting a coordinated program of research between the States in cooperation with the Department with illustrations from the research program as developed under the Bankhead-Jones fund. Director Fletcher, I am sure, is in a position to present the subject from the State station angle in a way to point out opportunities which I have not included, and, at the same time, to guard against ineffective suggestions which may be drawn from what I have presented.

Personally, I feel that we have made a good start under the Bankhead-Jones Act and I am confident of progressive development during the next few years. The spirit of cooperation is excellent among both administrators and research workers of the State stations and the Department. Constant effort is necessary, however, to take advantage of this spirit of cooperation and work out ways of coordinating our far-flung investigations without spending an unwarranted amount of time away from the actual individual research. After all, we must have effective research by the individual workers or we may have a coordinated plan without results.